INTERNATIONAL JOURNAL OF SOLIDS and STRUCTURES

Volume Contents and Author Index
Volume 25, 1989

PERGAMON PRESS

OXFORD · NEW YORK

BEIJING · FRANKFURT · SÃO PAULO · SYDNEY · TOKYO · TORONTO

INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES

Editor-in-Chief: CHARLES STEELE

Associate Editor: MARIE-LOUISE STEELE
Division of Applied Mechanics
Stanford University, Stanford, California
94305

Consulting Editor and Editor-in-Chief, 1965–1985: GEORGE HERRMANN

Board of Editors

J. D. ACHENBACH	*Northwestern University*
B. A. BOLEY	*Columbia University*
V. V. BOLOTIN	*USSR Academy of Sciences*
L. FINZI	*Milan Polytechnic Institute*
Y. C. FUNG	*University of California, San Diego*
H. J. GREENBERG	*University of Denver*
H. LIEBOWITZ	*The George Washington University*
C. MASSONNET	*University of Liege*
E. W. PARKES	*University of Leeds*
W. ZERNA	*Ruhr-Universität, Bochum*
O. C. ZIENKIEWICZ	*University College of Swansea*
H. ZORSKI	*Polish Academy of Sciences*

Editorial Advisory Board

J. H. ARGYRIS	*Stuttgart*	M. MIKKOLA	*Helsinki*
L. BEVILACQUA	*Rio de Janeiro*	F. NIORDSON	*Lyngby*
J. L. ERICKSEN	*Minneapolis*	F. DEL POZO	*Madrid*
J. FERRY BORGES	*Lisbon*	E. REISSNER	*San Diego*
N. J. HOFF	*Stanford*	J. SINGER	*Haifa*
W. T. KOITER	*Delft*	I. N. SNEDDON	*Glasgow*
H. LIPPMANN	*München*	F. ZIEGLER	*Wien*

Publishing, Subscription and Advertising Offices: Pergamon Press plc, Headington Hill Hall, Oxford OX3 0BW, U.K.; Pergamon Press, Inc., Maxwell House, Fairview Park, Elmsford, NY 10523, U.S.A.

Published monthly. Annual institutional subscription rate (1990) DM 1270.00. Two-year institutional rate (1990/91) DM 2413.00. Personal subscription rate for those whose library subscribes at the regular rate (1990) DM 248.00. Prices are subject to change without notice. Subscription enquiries from customers in North America should be sent to: Pergamon Press, Inc., Maxwell House, Fairview Park, Elmsford, NY 10523, U.S.A., and for the remainder of the world to: Pergamon Press plc, Headington Hill Hall, Oxford OX3 0BW, U.K.

Back Issues

Back issues of all previously published volumes, in both hard copy and on microform, are available direct from Pergamon Press offices.

Copyright © 1989 Pergamon Press plc

It is a condition of publication that manuscripts submitted to the journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. However, assignment of copyright is not required from authors who work for organizations which do not permit such assignment. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature, and translations. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

PHOTOCOPYING INFORMATION FOR USERS IN THE U.S.A.

The Item-fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided the stated fee for copying, beyond that permitted by Section 107 or 108 of the United States Copyright Law, is paid. The appropriate remittance of $3.00 per copy per article is paid directly to the Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970.

PERMISSION FOR OTHER USE

The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works, or for resale. Specific written permission must be obtained from the publisher for such copying.

The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.

The Item-fee Code for this publication is: 0020–7683/89 $3.00 + .00

Volume Contents

NUMBER 1

N. Nishimura and **S. Kobayashi**	1	A boundary integral equation method for consolidation problems
Andrzej Służalec	23	Shape optimization of weld surface
Alavandi Bhimaraddi	33	Non-linear free vibration analysis of composite plates with initial imperfections and in-plane loading
Dimitris C. Lagoudas, Chung-Yuen Hui and **S. Leigh Phoenix**	45	Time evolution of overstress profiles near broken fibers in a composite with a viscoelastic matrix
Bogdan Bochenek and **Antoni Gajewski**	67	Multimodal optimization of arches under stability constraints with two independent design functions
H. K. Stolarski and **M. Y. M. Chiang**	75	On the significance of the logarithmic term in the free edge stress singularity of composite laminates

NUMBER 2

J. G. Ren and **D. R. J. Owen**	95	Vibration and buckling of laminated plates
Huajian Gao	107	Weight functions for external circular cracks
Andrew S. Bicos and **George S. Springer**	129	Analysis of free damped vibration of laminated composite plates and shells
Kwang S. Woo and **Prodyot K. Basu**	151	Analysis of singular cylindrical shells by p-version of FEM
Bing-Hua Wu and **F. Erdogan**	167	The surface and through crack problems in orthotropic plates
F. Blouin and **A. Cardou**	189	A study of helically reinforced cylinders under axially symmetric loads and application to strand mathematical modelling
Sunil Saigal and **W. A. Kistler**	201	A direct vector simulation for the analyses of nodal and undulating elastica

NUMBER 3

P. S. Theocaris and **L. Petrou**	213	From the rectangular hole to the ideal crack
Mehdi Farshad and **Behrouz Tabarrok**	235	A simplified stability theory of general shells

P. M. Naghdi and **M. B. Rubin** 249 On the significance of normal cross-sectional extension in beam theory with application to contact problems

James F. Bell 267 Experiments on the kinematics of large plastic strain in ordered solids

László Szabó and **Mihály Balla** 279 Comparison of some stress rates

J. Lubliner, J. Oliver, S. Oller and **E. Oñate** 299 A plastic-damage model for concrete

Bhavani V. Sankar 327 An integral equation for the problem of smooth indentation of orthotropic beams

NUMBER 4

Lawrence E. Doxsee, Jr. 339 A higher-order theory of hygrothermal behavior of laminated composite shells

T.-L. Sham 357 The theory of higher order weight functions for linear elastic plane problems

F. Santosa and **W. W. Symes** 381 A model for a composite with anisotropic dissipation by homogenization

L. M. Brock and **J.-S. Wu** 393 Transient generalized forces due to dislocation array–growing crack interaction

Alberto Carpinteri 407 Decrease of apparent tensile and bending strength with specimen size: two different explanations based on fracture mechanics

C. Y. Wang 431 Bending of a built-up sandwich beam

Richard V. Browning, Morton E. Gurtin and **William O. Williams** 441 A model for viscoplastic materials with temperature dependence

NUMBER 5

H. Lippmann 459 Velocity field equations and strain localization in rigid–plastic materials

N. K. Chandiramani, L. Librescu and **J. Aboudi** 465 The theory of orthotropic viscoelastic shear deformable composite flat panels and their dynamic stability

Y. K. Cheung and **Chen Wanji** 483 Hybrid element method for incompressible and nearly incompressible materials

E. S. Folias 497 On the three-dimensional bending theory of cracked plates

G. Cederbaum, L. Librescu and **I. Elishakoff** 515 Remarks on a dynamical higher-order theory of laminated plates and its application in random vibration response

Sunil Saigal, J. T. Borggaard and **J. H. Kane** 527 Boundary element implicit differentiation equations for design sensitivities of axisymmetric structures

Tsuneyoshi Nakamura and **Izuru Takewaki** 539 Optimal elastic structures with frequency-dependent elastic supports

R. L. Ryan and **S. Mall** 553 Interaction of shear waves with a periodic array of rigid strips

Alavandi Bhimaraddi 563 Nonlinear vibrations of in-plane loaded, imperfect, orthotropic plates using the perturbation technique

Announcement

577 Plasticity '89

NUMBER 6

Jean-Claude Ramirez 579 Deformation instabilities in a thin plastic film on an elastic substrate due to strain mismatch

B. L. Karihaloo and **Xiaofan Huang** 591 Three-dimensional elastic crack tip interactions with shear transformation strains

George C. Johnson and **William C. Springer** 609 A comparison of measured and predicted second- and third-order elastic constants of a textured aggregate

Yoshiaki Goto and **W. F. Chen** 621 On the validity of Wagner hypothesis

David M. Stump and **Bernard Budiansky** 635 Crack-growth resistance in transformation-toughened ceramics

U. K. Singh and **P. J. Digby** 647 A continuum damage model for simulation of the progressive failure of brittle rocks

Ching S. Chang, Anil Misra and **Jia H. Xue** 665 Incremental stress–strain relationships for regular packings made of multi-sized particles

Abo-el-Nour Abd-Alla and **Gérard A. Maugin** 683 Harmonic generation and anisochronism in magneto-strictive materials

NUMBER 7

L. K. Dong, H. Y. Zhang and **C. W. Lung** 707 Application of gauge theory of defects to fracture

H. Møllmann and **P. Goltermann** 715 Interactive buckling in thin-walled beams—I. Theory

P. Goltermann and **H. Møllmann** 729 Interactive buckling in thin-walled beams—II. Applications

Eivind Steen 751 Elastic buckling and postbuckling of eccentrically stiffened plates

W. J. Stronge and **T. X. Yu** 769 Dynamic plastic deformation in strain-hardening and strain-softening cantilevers

A. P. S. Selvadurai, B. M. Singh and **M. C. Au** 783 Axial loading of a rigid disc inclusion with a debonded region

A. Zubelewicz and **L. M. Keer** 797 Micromechanically based constitutive modeling of crystalline materials

J. W. Ju 803 On energy-based coupled elastoplastic damage theories: constitutive modeling and computational aspects

Announcement

835 Symposium on Analytical and Computational Models for Shells. ASME Winter Annual Meeting, San Francisco, California, 10–15 December 1989

NUMBER 8

Alfred Zmitrowicz 837 Mathematical descriptions of anisotropic friction

C. J. Fazio 863 A one-dimensional study of the limit cases of the endochronic theory

Srinivasan Sridharan and **Mao-Hua Peng** 879 Performance of axially compressed stiffened panels

Zhanjun Gao and **T. Mura** 901 Nondestructive evaluation of interfacial damages in composite materials

K. Hashiguchi 917 Subloading surface model in unconventional plasticity

Sunil Saigal 947 Treatment of body forces in axisymmetric boundary element design sensitivity formulation

C. Dupuis and **J. Rousselet** 961 Letter to the Editor

J. M. Montalvão e Silva and **A. P. V. Urgueira** 963 Authors' closure

Jarmo Salonen 965 Letter to the Editor

Eric M. Lui and **W.-F. Chen** 969 Authors' closure

Announcement and Call for Papers

971 IUTAM Symposium on Inelastic Deformation of Composite Materials. Rensselaer Polytechnic Institute, Troy, New York, 29 May–1 June 1990

NUMBER 9

K. Dems, Z. Mróz and **D. Szelag** 973 Optimal design of rib-stiffeners in disks and plates

G. F. Dargush and **P. K. Banerjee** 999 Development of a boundary element method for time-dependent planar thermoelasticity

U. K. Singh and **P. J. Digby** 1023 The application of a continuum damage model in the finite element simulation of the progressive failure and localization of deformation in brittle rock structures

M. Kurashige 1039 A thermoelastic theory of fluid-filled porous materials

Ming-Yuan He and **John W. Hutchinson** 1053 Crack deflection at an interface between dissimilar elastic materials

Y. M. Tsai 1069 Torsional vibrations of a circular disk on an infinite transversely isotropic medium

Solomon Dinkevich 1077 On the spectral theory of linear mechanical structures governed by fourth order self-adjoint ordinary differential equations

Announcements

1101 Symposium on Computational Technology for Flight Vehicles. Sheraton National Hotel, Washington, DC, 5–7 November 1990

1103 Twenty-second Midwestern Mechanics Conference. University of Missouri–Rolla, Rolla, Missouri, 7–9 October 1991

NUMBER 10

A. Chudnovsky, L. Papernik and **M. Reitman** 1105 Tribute to Professor Lazar M. Kachanov on his 75th Birthday

Yuexi Xiong, Tsun Kuei Wang and **B. Tabarrok** 1107 On a centripetally loaded model simulating Beck's column

Doron Shalev and **K. L. Reifsnider** 1115 Influence of relative ply orientations on the nature of the edge effect singularities for a circular hole in a composite laminate

Zhigang Suo 1133 Singularities interacting with interfaces and cracks

Viggo Tvergaard 1143 Numerical study of localization in a void-sheet

S. G. Russell 1157 An investigation of the fracture process zone near the tip of a steadily propagating tensile crack

R. Paskaramoorthy, A. H. Shah and **S. K. Datta** 1177 Scattering of flexural waves by cavities in a plate

E. S. Folias 1193 On the interlaminar stresses of a composite plate around the neighborhood of a hole

Rohan Abeyaratne and **Guo-hua Jiang** 1201 Dilatationally nonlinear elastic materials—I. Some theory

Rohan Abeyaratne and **Guo-hua Jiang** 1221 Dilatationally nonlinear elastic materials—II. An example illustrating stress concentration reduction

Announcement

1235 European Mechanics Colloquia 1990

Announcement and Call for Papers

1237 Third International Conference on Constitutive Laws for Engineering Materials. University of Arizona, Tucson, AZ 85721, U.S.A., 7–12 January 1991

NUMBER 11

M.-S. (Olivia) Chou-Wang and **C. O. Horgan** 1239 Void nucleation and growth for a class of incompressible nonlinearly elastic materials

Jorge G. S. Patiño 1255 Stability and energy minimization in elasticity with damage

G. P. Cherepanov 1267 A remark on the dynamic invariant or path-independent integral

S. Burhanettin Altan 1271 Uniqueness of initial-boundary value problems in nonlocal elasticity

Y. Benveniste, G. J. Dvorak, J. Zarzour and **E. C. J. Wung** 1279 On interacting cracks and complex crack configurations in linear elastic media

Chien-Ching Ma and **Bao-Luh Hour** 1295 Analysis of dissimilar anisotropic wedges subjected to antiplane shear deformation

J. B. Leblond 1311 Crack paths in plane situations—I. General form of the expansion of the stress intensity factors

A. K. Naghdi and **R. T. Shield** 1327 Bending and torsion of cantilevers with cross-sections in the form of solid circular sectors

Zhigang Suo and **John W. Hutchinson** 1337 Steady-state cracking in brittle substrates beneath adherent films

Announcements and Calls for Papers

1355 Twelfth International Conference on The Boundary Element Method. Sapporo, Hokkaido, Japan, 24–28 September 1990

1357 First International Conference on Vibration Problems of Mathematical Elasticity and Physics. A.C. College, Jalpaigri, W. Bengal, India, 20–23 October 1990

NUMBER 12

Nikolaos Simos and **Ali M. Sadegh**	1359	The effect of transverse shear onto the singular solutions of a complete spherical shell
Jan G. Rots and **René de Borst**	1381	Analysis of concrete fracture in "direct" tension
T. Tarnai	1395	Duality between plane trusses and grillages
T. Nakamura and **D. M. Parks**	1411	Antisymmetrical 3-D stress field near the crack front of a thin elastic plate
Tze-jer Chuang and **Yiu-Wing Mai**	1427	Flexural behavior of strain-softening solids
J. R. Yeh	1445	The mechanics of multiple transverse cracking in composite laminates
Biao Wang, Dian-Fu Wang and **Duo Wang**	1457	An investigation of elastic field created by randomly distributed inclusions
T. G. Rogers and **A. J. M. Spencer**	1467	Thermoelastic stress analysis of moderately thick inhomogeneous and laminated plates
Zdeněk P. Bažant and **Feng-Bao Lin**	1483	Stability against localization of softening into ellipsoids and bands: parameter study
	1499	Corrigenda
	i	Volume Contents and Author Index for Volume 25, 1989